

IN THE CLAIMS:

The text of all pending claims is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~striketrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

1. (Currently Amended) A millimeter-wave band radio communication method in which a receiver receives both an RF-band modulated signal ~~transmitted from a transmitter and~~ an un-modulated carrier ~~also transmitted from the a transmitter, and the un-modulated carrier~~ having a phase noise characteristic coherent with that of the RF-band modulated signal, and generates a product of ~~the two components~~ received signals to thereby restore an IF-band transmission source signal, the method comprising steps of:

disposing a plurality of receiving circuits, each formed as a single constituent element by combining a planar printed small receiving antenna and a micro planar receiving circuit, at intervals smaller than a wavelength corresponding to an IF band;

~~mixing detection outputs obtained through detection signals detected at the individual ones of the~~ receiving circuits ~~so as to output an IF-band composite output, which is then demodulated; and~~

~~before being mixed to obtain the IF-band composite output~~ mixing the signals, making phase adjustment and amplitude weighting ~~for of each of the detection outputs from signals respectively detected by one of the individual receiving circuits.~~

2. (Currently Amended) A millimeter-wave band radio communication method in which a receiver receives both an RF-band modulated signal ~~transmitted from a transmitter and~~ an un-modulated carrier ~~also transmitted from the transmitter, and the un-modulated carrier~~ having a phase noise characteristic coherent with that of the RF-band modulated signal, and generates a product of ~~the two components~~ received signals to thereby restore an IF-band transmission source signal, the method comprising steps of:

disposing a plurality of receiving circuits, each formed as a single constituent element by combining a planar printed small receiving antenna and a micro planar receiving circuit, at intervals smaller than a wavelength corresponding to an IF band, three or more of the receiving circuits being disposed at irregular intervals which differ from one another; and

~~mixing detection outputs obtained through detection signals detected at the individual ones of the~~ receiving circuits ~~so as to~~ output an IF-band composite output, which is then demodulated; and

~~disposing three or more of the receiving circuits at irregular intervals which differ from one another.~~

3. (Currently Amended) A millimeter-wave band radio communication method in which a receiver receives both an RF-band modulated signal ~~transmitted from a transmitter and~~ an un-modulated carrier ~~also transmitted from the a transmitter, and the un-modulated carrier~~ having a phase noise characteristic coherent with that of the RF-band modulated signal, and generates a product of ~~the two components received signals~~ to thereby restore an IF-band transmission source signal, the method ~~steps of comprising:~~

disposing a plurality of receiving circuits, each formed as a single constituent element by combining a planar printed small receiving antenna and a micro planar receiving circuit, at intervals smaller than a wavelength corresponding to an IF band;

~~mixing detection outputs obtained through detection signals detected at the individual ones of the~~ receiving circuits ~~so as to~~ output an IF-band composite output, which is then demodulated; and

providing two or more substrates each carrying ~~the at least one~~ receiving circuit, and changing ~~the intervals between the substrates manually or automatically in accordance with the~~ power of the IF-band composite output.

4. (Currently Amended) A millimeter-wave band radio communication method in which a receiver receives both an RF-band modulated signal ~~transmitted from a transmitter and~~ an un-modulated carrier ~~also transmitted from the a transmitter, and the un-modulated carrier~~ having a phase noise characteristic coherent with that of the RF-band modulated signal, and generates a product of ~~the two components received signals~~ to thereby restore an IF-band transmission source signal, the method comprising ~~steps of:~~

disposing a plurality of receiving circuits, each formed as a single constituent element by combining a planar printed small receiving antenna and a micro planar receiving circuit, at intervals smaller than a wavelength corresponding to an IF band, the receiving circuits being arranged two-dimensionally along longitudinal and transverse directions or three-dimensionally; and

~~mixing detection outputs obtained through detection signals detected at the individual~~

~~ones of the~~ receiving circuits ~~so as to~~ output an IF-band composite output, which is then demodulated; and

~~arranging the individual receiving circuits two dimensionally along longitudinal and transverse directions or three dimensionally.~~

5. (Currently Amended) A millimeter-wave band radio communication method according to claim 4, wherein an antenna used in the transmitter is adapted to transmit circularly polarized waves, and about a half the of antennas ~~used in the receiver~~ receiving circuits are adapted to receive horizontally polarized waves and the ~~remaining other half of the~~ antennas in the receiving circuits are adapted to receive vertically polarized waves.

6. (Currently Amended) A millimeter-wave band radio communication system in which a receiver receives both an RF-band modulated signal ~~transmitted from a transmitter and an un-modulated carrier also transmitted from the a transmitter, and the un-modulated carrier~~ having a phase noise characteristic coherent with that of the RF-band modulated signal, and generates a product of ~~the two components received signals~~ to thereby restore an IF-band transmission source signal, the system comprising:

a plurality of receiving circuits each formed as a single constituent element by combining a planar printed small receiving antenna and a micro planar receiving circuit, and disposed at intervals smaller than a wavelength corresponding to an IF band;

a detection output composing section ~~for mixing detection outputs obtained through detection that mixes signals detected at the individual ones of the~~ receiving circuits so as to output an IF-band composite output;

an IF signal demodulation section ~~for receiving that receives~~ the IF-band composite output from the detection output composing section, ~~and for demodulating demodulates~~ the IF-band composite output; and

a variable phase shifter and a variable attenuator ~~for performing that perform~~ phase adjustment and amplitude weighting, respectively, ~~for the detection output from each signal respectively detected by a receiving circuit before mixing of the detection output at the detection output composing section~~ mixes the signals.

7. (Currently Amended) A millimeter-wave band radio communication system in which a receiver receives both an RF-band modulated signal ~~transmitted from a transmitter and~~

an un-modulated carrier ~~also-transmitted from the a transmitter, and the un-modulated carrier~~ having a phase noise characteristic coherent with that of the RF-band modulated signal, and generates a product of ~~the two components~~ received signals to thereby restore an IF-band transmission source signal, the system comprising:

a plurality of receiving circuits each formed as a single constituent element by combining a planar printed small receiving antenna and a micro planar receiving circuit, and disposed at intervals smaller than a wavelength corresponding to an IF band;

~~a detection output composing section for mixing detection outputs obtained through detection that mixes signals detected at the individual ones of the~~ receiving circuits ~~so as to~~ output an IF-band composite output; and

an IF signal demodulation section ~~for receiving that receives~~ the IF-band composite output from the detection output composing section, ~~and for demodulating-demodulates~~ the IF-band composite output, wherein

three or more of the receiving circuits are provided and disposed at irregular intervals which differ from one another.

8. (Currently Amended) A millimeter-wave band radio communication system in which a receiver receives both an RF-band modulated signal transmitted ~~from a transmitter and~~ an un-modulated carrier ~~also-transmitted from the a transmitter, and the un-modulated carrier~~ having a phase noise characteristic coherent with that of the RF-band modulated signal, and generates a product of ~~the two components~~ received signals to thereby restore an IF-band transmission source signal, the system comprising:

a plurality of receiving circuits each formed as a single constituent element by combining a planar printed small receiving antenna and a micro planar receiving circuit, and disposed at intervals smaller than a wavelength corresponding to an IF band;

~~a detection output composing section for mixing detection outputs obtained through detection that mixes signals detected at the individual ones of the~~ receiving circuits ~~so as to~~ output an IF-band composite output; and

an IF signal demodulation section ~~for receiving that receives~~ the IF-band composite output from the detection output composing section, ~~and for demodulating-demodulates~~ the IF-band composite output, wherein

two or more substrates each carrying ~~the at least one~~ receiving circuit are provided, and ~~the intervals between the substrates are changed manually or automatically in accordance with the power of the IF-band composite output.~~

9. (Currently Amended) A millimeter-wave band radio communication system in which a receiver receives both an RF-band modulated signal ~~transmitted from a transmitter and~~ an un-modulated carrier ~~also transmitted from the a transmitter, and the un-modulated carrier~~ having a phase noise characteristic coherent with that of the RF-band modulated signal, and generates a product of ~~the two components~~ received signals to thereby restore an IF-band transmission source signal, the system comprising:

a plurality of receiving circuits each formed as a single constituent element by combining a planar printed small receiving antenna and a micro planar receiving circuit, and disposed at intervals ~~sufficiently smaller than a wavelength corresponding to an IF band;~~

a detection output composing section ~~for mixing detection outputs from the that mixes~~ signals detected by individual ones of the receiving circuits so as to output an IF-band composite output; and

an IF signal demodulation section ~~for receiving that receives the IF-band composite~~ output from the detection output composing section, ~~and for demodulating demodulates the IF-~~ band composite output, wherein

the ~~individual-receiving~~ circuits are arranged two-dimensionally along longitudinal and transverse directions or three-dimensionally.

10. (Currently Amended) A millimeter-wave band radio communication system according to claim 9, wherein an antenna used in the transmitter is adapted to transmit circularly polarized waves, and about half or a portion of ~~the antennas of the receiving circuits of the receiver~~ are adapted to receive first polarized waves and the ~~remaining other~~ antennas are adapted to receive second polarized waves having a second polarization direction perpendicular to a first polarization direction of the first polarized waves.